A STUDY ON COMPLICATIONS OF LAPAROSCOPIC SURGERY

Dissertation submitted in

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CERTIFICATE

Certified that this is the bonafide dissertation done by

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Degree of MASTER OF SURGERY

Branch – I (GENERAL SURGERY)

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DECLARATION

I solemnly declare that is dissertation on **Intra and post operative Laparoscopic Abdominal Surgical complications** was done by me at Coimbatore Medical College Hospital, Coimbatore under the guidance and supervision of **Dr.B.Easwaran.MS.**

Place: **Dr.A.M.UMASHANKAR**
Date :

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Finally I thank all the patients around whom all our work revolve and towards whom all efforts trend.

STUDY ON INTRA AND POST OPERATIVE LAPAROSCOPIC ABDOMINAL SURGICAL COMPLICATION

TABLE OF CONTENTS

WHEN YOU DO THE COMMON THINGS IN LIFE IN AN UNCOMMON WAY YOU WILL COMMAND THE ATTENTION OF THE WORLD

-GEROGE WASHINGTON CARVER

(1864 – 1943)

INTRODUCTION

Informatics, electronics, and robotics' are intermingled fields that constantly changes the way we experience our lives and practice medicine. For instance, we have internet connections, CT, MRT, Interactive video displays now a days. Despite many decades of these technologic developments the performance of surgical operations (the cutting and suturing of the artisan) remained unchanged. The advent of minimally invasive surgery, brought about a major deviation from traditional surgery. This method has several advantages over the traditional system, but it require sophisticated instruments, training and skill. Without these things we some time land up in complications. This dissertation mainly focus on the physiological changes during MIS and it's complication.

AIM

To understand various physiological changes normally occur during the laparoscopic surgical procedures, and various complication Intra and Post operative periods in laparoscopic surgery.

MINIMAL ACCESS SURGERY

Definition

Minimal access surgery is a marriage of modern technology and surgical innovation that aims to accomplish surgical therapeutic goals with minimal somatic and psychological trauma performing major surgery through small incision after using miniature High tech. Imaging system to minimize the trauma of traditional surgical methods.

It is less disfiguring than conventional technique.

With increasing experience it offers cost effectiveness both to health services and to employees by shortening hospital stays and allowing faster recuperation[18,19]

MINIMAL ACCESS SURGERY

Minimal access surgery more accurately descries the small incision generally necessary to gain access to surgical sites in High tech. Surgery, but John Wickham's terms minimally invasive surgery (MIS) is widely used because it describes the paradox of post modern High tech. Surgery. Small holes big operation the minimalness of the access and invasiveness of the procedure.

Minimal access surgery has crossed all traditional boundaries of specialties and disciplines, shared, barrowed and overlapping technologies and information are encouraging a multidisciplinary approach that serves the whole patient rather than a specific organ system.

They can be categorized as follows.

1. Laparoscopy
2. Thoracoscopy
3. Endoluminal endoscopy
4. Perivisceral endoscopy
5. Arthroscopy and intra articular joint surgery.

Among this our present aim is mainly revolving around the laparoscopy.

HISTORICAL BACK GROUND

While the term minimally invasive surgery is relatively recent the history of It's component parts in nearly 100 years old [18,19]

- Primitive Laparoscopy, placing the cystoscopy within an Inflated abdomen was first performed by Kelling in 1901.
- Illumination of the abdomen required heart elements at the tip of the scope and it is dangerous to the Intraperitoneal structures.
- 1950 Hopkin rod lens a method of transmitting light through solid quartz with no neat and little light loss.
- Opening the field of fibreoptics allowing the development of flexible endoscopes.
- 1970 – Faster growth of flexible endoscopes.
- Mid 1970 – Use of flexible endoscopes for therapeutic from diagnostic.
- First the technique was limited to diagnosis of Intra peritoneal tuberculosis and disseminated cancer.

Later modification of equipment allowed simple Biopsy of suspicious lesions and eventually accomplishment of simple operations such as tubal ligation and appendicectomy.

The extent of the operation was limited by the need for the surgeon to view the abdomen through an eye piece and to hold the laparoscope with another hand.

1980 – Laparoscope and video camera joined together.

Assistant & other members are of the surgical team also participated in the proceedings.

1985- First laparoscopic cholecystectomy in france performed.

PRINCIPLES OF LAPAROSOCPIC SURGERY

A Rigid Endoscope is Introduced through a metal sleeve in the peritoneal cavity, which has been previously inflated with carbon di oxide(or) air to produce a pneumoperitioneum . Further Metal sleeve (or) ports are inserted to enable Instrument access and their use for dissection. With improved instruments and more experience it is likely that other advanced procedures currently regarded as controversial will also become fully accepted.

SURGICAL TRAUMA IN OPEN AND LAPAROSCOPIC SURGERY

Most of the trauma of an open procedure is Inflicted because the surgeon must have wound large enough to give adequate exposure for safe dissection at the target site. The wound is often the cause of morbidity including infection, dehiscence, bleeding, herniation and nerve entrapment.

The pain of the wound prolongs recovery time and by reducing mobility contributes to an increased incidence of pulmonary collapse, chest infection and DVT. Mechanical and Human retractors cause additional trauma. Body wall retractors tend to Inflict localized damage/ may be as painful as the wound itself. But in laparoscopy the retraction is provided by the low pressure pneumoperitoneum giving a diffuse force applied gently and evenly over the whole body wall, causing minimal trauma. Exposure of any body cavity to the atmosphere also causes morbidity through cooling and fluid loss by evaporation.

The Incidence of Post surgical adhesions has been reduced by the use of the laparoscope because less damage to the delicate serosal covering.

In Handling Intestinal loops the surgeon and assistant disturb the peristaltic activity of the gut and provoke adynamic ileus.

Visualization is magnified and improved.

ADVANTAGES OF MINIMAL ACCESS SURGERY[18]

1. Decreased wound size
2. Reduction in wound
    a. Infection
    b. Dehiscence
    c. Bleeding
    d. Herniation
    e. Nerve entrapment
3. Decrease in wound pain
4. Improve mobility
5. Decreased would trauma
6. Decreased heat loss, fluid loss
7. Improved vision
8. Decreased stress response

Limitations of minimal access surgery

Surgeon must operate remote from the surgical field using an imaging system that provides a two dimensional representation of the operative site. Endoscope offer a whole new anatomical landscape which the surgeon must learn to navigate without the usual cues which make it easy to judge depth. Dependence on Hand eye co-ordination. Difficulty with haemostasis. Loss of tactile feed back.

The unique feature of endoscopic surgery

In the peritoneal cavity is the need to lift the abdominal wall from the abdominal organ to create working space[6].

Two methods have been devised for achieving this.

1. Pneumoperitoneum
2. Mechanical device (lap lift)

PNEUMOPERITONEUM[20,22,23]

Initially to distend the peritoneal cavity air was used. The Nitrogen in air less soluble in blood gradually absorbed across peritoneal cavity. Air pneumoperitoneum is more painful also. Subsequently carbondioxide and Nitrous oxide were used for inflating the abdomen. N_2O had the advantage of being physiologically inert and rapidly absorbed, also provide better analgesia when laparoscopy performed under local anesthesia. No evidence of combustion, it's safety with in the peritoneal cavity have established. It reduce the Intra operative end tidal CO_2 and minute ventilation required to maintain homeostasis when compared with CO2 pneumoperitoneum. The effect of N_2O on tumour biology and development of port site metastasis are unknown.

It's safety in pregnancy has yet to be elucidated.

CO_2, insufflator (laparoflator)

CO_2 PNEUMOPERITONEUM

CO_2 - Most commonly used distension medium.

Physiological effects can be divided into two areas.

1. Gas specific effects.
2. Pressure specific effects.

GAS SPECIFIC EFFECTS

CO_2 Rapidly absorbed across peritoneal membrane.

$CO_2 + H_2O – H2CO3 – H^+ + HC03^-$

Respiratory acidosis by the generation of carbonic Acid.

Body Buffer largest reserve in the bone, absorb CO_2 minimize the development of Hypercarbia (or) respiratory acidosis during brief endoscopic procedures. Once the body buffers are saturated respiratory acidosis develop rapidly.

Hyspercarbia

Respiratory acidosis

Cardiac arrhymias

Increased vascular resistance

High BP

Increased cardiac work load

Increased myocardial O2 demand

Increased chance of MI in limited Cardiac reserve patient,

PRESSURE SPECIFIC EFFECT

1. Major blood vessel
2. Respiratory system
3. Cardiovasular system
4. Renal system
5. effect on coagulation

ABDOMINAL LIFT DEVICE[6]

Placed through 10 to 12mm trocar at the umbilicus.

These device have the advantage of creating little physiological derangements. But they are bulky and intrusive.

The exposure and working room offered by left devices also are inferior to those accomplished by pneumoperitoneum.

Lifting the anterior abdominal wall causes a pinching in of the lateral flank walls, displacing the Bowel medially and anteriorly into the operative field.

A pneumoperitoneum with it's well distributed intra abdominal pressure, provides better exposure.

Abdominal lift device cause more post operative pain.

PHYSIOLOGY

Although laparoscopy causes fewer untoward effects than open surgery, physiologic functions[20] are altered during performance of any surgery / surgical procedure. Insufflation of gas into the peritoneum, preperitoneal space or, retroperitoneal space increases intra abdominal pressure – so

Impairing ventilation

Decrease venous return

Depressing circulation

Reducing renal perfusion

Increasing intra cranial pressure.

This process is analogous to although less marked than abdominal compartment syndrome. The type of gas used for insufflation is important. Obesity magnifies the effects of pneumoperitoneum and complicates patient positioning. The patients size and weight place stress on pressure points, increase the difficulty of securing the patient to the table and increase intra abdominal pressure. Patient position is also important, especially. It's effects on the circulatory system.

Adequate visualization of pelvic and lower abdominal structures requires steep trendelenburg whereas those in the upper abdomen requires modified lithotomy (or) split leg position and reverse trendelenburg position. Some procedures require lateral decubitus position.

All of these positions place particular stress on pressure points. Necessitating careful padding. Excessive localized pressure and shifting of the center of gravity increase the risk for development of pressure sores and nerve compression syndromes post operatively. Although intraoperative management of the patients undergoing laparoscopy can be challenging benefits are derived post operatively.

PULMONARY EFFECT[22,23]

Peritoneal insufflation.
Increased Intra abdominal pressure and volume
Decreased Diaphramatic excussion
Peak airway pressure.
Decreased Vital capacity
Decreased Pulmonary compliance
Basal lung segments compressed.
Decreased Functional residual capacity
Increasing alveolar dead space
Ventilation and perfusion equation become altered.

Absorption from the peritoneum increases delivery of Co_2 to the lung as much as 50% during Co_2 pneumoperitoneum. Close monitoring of end tidal co_2 and arterial blood gases is essential for at risk patient during laparoscopy. Since elevated PCo_2 continue for approximately 30 mints after release of the pneumoperitoneum, monitoring must extend into the post op periods[25]

Alternate gases helium, Neon, and argon suggested for creating pnemoperitoneum. These gases are appealing because they causes no metabotic effects, but are poorly soluble in the blood (unlike CO_2 and N_20) and prove to create gas emboli if the gas has direct access to the venous system.

It also induce locoreginal acidosis, in the absence of systemic acidosis, impairing microcirculation and decreasing organ blood flow[15,24]

Increased intra abdominal pressure, decrease blood flow to stomach, jejunum, colon and liver[28]. Pulmonary function test including FVC, FEV in 1 second, PEER, shows smaller decrements post operatively those patient undergoing laparoscopic surgery compared with open surgery. More important the benefit truly into lower incidence of atelectasis and improved orygenation.[20,27]

CARDIOVASULAR EFFECTS

CVS effects of laparoscopy[27,28] are well tolerated in healthy individuals but pose a threat to patients with comorbid conditions that impair compensatory mechanism.[17,20,24]

Careful monitoring is mandatory.

Optimization of patients fluid balance is important.

Open operation may be safer in patient with severely impaired cardiac function .

The consequence of laparoscopy on CVS are due to

1. Increased intra abdominal pressure.
2. Patient position

Pneumoperitoneum[20,21,27] - Produce

1. Increase CVP
2. Increase CWP (Preload)
3. Increase mean arterial pressure
4. Increase systemic vascular resistance (afterload)

These changes have a dual effect

Increased preload tends to argument cardiac output

Increased afterload decrease cardiac output.

Cardiac work load increased.

Effect on blood vessels[26,27]

IVC and iliac veins compressed . So flow from lower limb to the heart decreased. Increased pressure over the splanchnic circulation increase blood flow towards heart. Increased pressure over the arota increase after load, increase cardiac work load and cardiac strain. Increased pressure over masenteric and GIT blood vessels, renal blood vessels decrease the visceral blood flow.

Patient with cardiac disease tolerate the effects of laparoscopy poorly.

The cardiovascular changes on cardiac output during Laparsocopic pnemoperitoneum procedures depends on the patients volume status, autonomic response and cardiac reserve.

Physiological changes associated with patient positioning and repositioning are equally important. Trendelenburg position increases intrathoracic pressure, CVP, CWP, mean arterial pressure and increasing cardiac work. Reverse –Trendelenburg position leads to reduction in cardiac output by decreasing preload and may causes hypotension[26]

Hypercarbia due to CO_2 absorption causes arteriolar dilation and myocardial depression which tend to lower blood pressure. These effects are counter by autonomic response, mostly due to the sympathetic nervous system, that elevates heart rate, systolic blood pressure, CVP, left ventricular stroke volume and cardiac output.

Also indirect effect on rennin, angiotension and vasopressin leads to decrease in urine output [13,29].

Patient with cardiac disease are at increased risk for complications such as M I during and after laparoscopic surgery.

RENAL EFFECT[13,29]

Increased intra abdominal pressure.

Decreased Cardiac output (Systemic effect on CVS)

Decrease the blood flow to the kidney (Direct effect over renal vessels)

Decreased Urine output (intraoperative Oliguria)

Activate Renin Angiotensin Mechanism (Local effect)

These effects depends on the volume status of the patient.

The effects on both renal blood flow and urine output can be overcome by optimizing the patient volume status.

EFFECTS ON THE COAGULATION SYSTEM

Tissue trauma activates coagulation and fibrinolytic system.

So increased risk of venous thrombosis and pulmonary embolism, in surgical practice.

Hypercoagulation can be linked to three physiological abnormalities.

1. Endothelial injury
2. Stasis
3. Increased viscosity (or) abnormalities of circulating blood components.

Although the tissue trauma is thought to be less with minimally invasive procedures, increasing intra abdominal pressure with pneumoperitoneum and patient positioning (Reverse trendelenburg position) decrease venous return from the lower limb.[20,27,30]

Increased intra abdominal pressure

Decrease venous return from LL

Increased Stasis

Increased risk of Thrombosis

But in practice it is not so because, relatively shorter duration of the procedures and early ambulation of the patient following the procedure.

D.Dimeres increase significantly more after open as compared to laparoscopic surgery.

Antitthrombis III and Protein C (both decrease coagulation)

Decrease in both groups.

Findings suggest less activation of the coagulation system with laparosocopic patient.

Although the risk appears less, patients may still develop venous thrombosis and pulmonary embolus mainly high risk patient like obeses, long duration lap surgical procedures.

Therefore deep venous thrombosis prophylaxis is indicated during laparoscopic procedures.

COMPLICATIONS

No surgery is without risk. Complication can occur [2,20,21]

In order to obtain acceptable results training programmes must include supervision at all levels of development and there must be a high degree of awareness of the potential risks laparoscopic surgery.

Complication may be associated with

1. Failure to complete the procedure
2. Anesthetic complication[10,11]
3. Induction of pneumoperitoneum
4. Insection of trocar and cannula[5,9,12,34]
5. Thermal instruments and injuries[21]
6. Mechanical instruments and injuries
7. Position and duration of surgery related complications.
8. Other associated complications.

FAILURE TO COMPLETE THE PROCEDURE

Failure to complete the procedure is not generally associated with morbidity, however if the laparoscopy is not completed safely, the patient may have to undergo laparotomy with it is attendant potential for complications. There may be failure due to inability to establish a pneumoperitoneum (or) complex disease process. However the major cause of failure is the experience of the surgeon (or) poor surgical technique. The need for proper training and supervision must be repeatedly stressed.

ANAESTHETIC COMPLICATION[10,11]

Complications directly attributable to the general anaesthesia are no different from those which may occur when any type of surgery is performed.

The use of a steep tendelenburg position and distension of the abdomen may both reduce the excursion of the diaphragm.[5,25,22,23]

CO_2 can be absorbed, particularly during prolonged operations. This combination of reduced depth of respiration and Hypercarbia puts the patient who is undergoing laparoscopy at increased risk of developing cardiac arrhythmias. Monitoring by pulse oximetry, the use of ETT intubation and positive pressure assisted ventilation reduce these risks to a minimum.

If arrhythmia occurs the anesthetist, will be responsible for it's management but at liberty to instruct the surgeon to return patient to supine position, evacuate the pneumoperitoneum and discontinue the surgery.

Vasovagal reflex may produce shock and collapse, especially if the anesthetic is not deep enough. It may be prevented by efficient anesthesia and should only be diagnosed when other causes if shock have been excluded.

PNEUMOPERITONEUM - VERESS NEEDLE INJURIES[9,12,34]

Extra Peritoneal gas insufflation

Failure to introduce the veress needle into the peritoneal cavity may produce extra peritoneal emphysema. This occur in about 2% of cases. Palpation of the abdomen may reveal the presence of crepitus. If this is recognized early the carbon dioxide may be allowed to escape and the needle reintroduced through the same (or) another site.

If the complication is not recognized during introduction of the gas, the typical appearance of extra peritoneal gas may be recognized when an attempt is made to telescope. It is always essential to view through the telescope during it's insertion through it's cannula. The typical spider web appearance caused by preperitoneal insufflation will be seen and further stripping of the peritoneum by the tip of the telescope avoided. In this situation, the laparoscope should be withdrawn and attempts made to express the gas, the needle may then be reintroduced through the same (or) another site.

Mediastinal emphysema

Gas may extend from a correctly introduced pnemoperitoneum into the mediatenum and create mediastinal emphysema. Extensive emphysema may cause cardiac embarrassment, which will be diagnosed by the anaesthetist. There will be less of dullness to percussion over the precordium. The laparoscopy must be abandoned and as much gas as possible evaluated the patient must be kept under close observation until the gas has been absorbed.

Pnemothorax

May result from insertion of the veress needle into the pleural cavity. Whenever a high site of insertion in chosen the needle should be directed away from the diaphragm and as always the standard protocol of aspiration and sounding test employed.

Pnemothorax should be suspected if there is difficulty in ventilating the patient. There may be a contra lateral mediastinal shift and increased tympanism over the affected area. The procedure should be abandoned and gas allowed to escape. The patient should be kept under observation.

Pneumo –omentum

The omentum will be penetrated by the veress needle in about 2% of cases. The misplacement should be recognized by the aspiration test and position of tip altered to free the needle. There will also be a raise in insufflation pressure, which should lead the surgeon to suspect an error in the position of the needle.

Penetration of a hollow viscus

Veress needle may enter the bladder, stomach (or) bowel.

Routine catheterization of the bladder, proper sitting of the needle should prevent bladder penetration. If pneumaturia is noted, the needle should partially withdrawn and the creation of pnemoperitoneum continued. The bladder peritoneum should be carefully inspected to ensure that no significant damage has been caused, the treatment of a simple puncture is conservative.

Penetration of the stomach may occur when an upper abdominal site of insertion is chosen (or) the stomach is distended during induction of anesthesia. Gastric distension may also occur if anesthesia is maintained with a mask and should be suspected if there is upper abdominal distension

and increased tympanism. In the case, the stomach should be aspirated with nasogastric tube.

The aspiration test permit early recognition of perforation of the GIT.

Bowel penetration should be suspected if there is asymmetric abdominal distension, belching, passing of flatus (or) faecial odour. In this case the induction pneumoperitoneum should be stopped and the needle re-sited to introduce pneumoperitoneum correctly.

A simple needle penetration requires no treatment but the patient should be kept under observation.

BLOOD VESSEL INJURY[9,12,15,20,21]

The veeress needle may penetrate omental (or) mesenteric vessels (or) any of the major abdominal (or) pelvic artries and veins. Damage to the major vessels may be prevented by lifting the abdominal wall angling the needle towards the pelvis once the initial thrust through the fascia has been made and by inserting only as much of the needle as necessary. Thin patient and children are at particular risk of this injury. It is impossible to ensure that the omentum is not in contact with the abdominal wall.

The aspiration test should indicate that the tip of the needle is in a vessel when blood is withdrawn. If this occurs the needle should be withdrawn, re positioned and pnemoperitoneum introduced. A careful examination made to determine the site and extent of injury.

Minor injury may be treated conservatively and re examined at the end of the procedure. Bleeding from the a major (or) formation of a large heamatoma formation, necessitates immediate laparotomy with the assistance of a vascular surgeon.

GAS EMBOLISM [19,21]

Intravascular insufflation of gas may lead to gas embolism (or) even death. This can only happen if the penetration by the veress needle goes unrecognized and insufflation commences. It should be prevented by routine use of the aspiration test. The patient should be turned on to the left lateral position and spin wheel murmur heard over the precordium. If the patient does not recover immediately than cardiac puncture (or) CVC in to the (Rt) ventricle to aspirate the air in the Apex of (Rt) ventricle before it entering into the lung.

Dramatic collapse may result from penetration of a major vessel but the bleeding may not be immediately evident if it is retro peritoneal. Collapse may also be caused by gas embolism. A thorough search must be made for evidence of the extent of vessel damage. This includes retraction of the bowel to expose the aorta above the pelvic brim. Where the most common perforation lies. Failure to do so may result in continued bleeding and formation of large haematoma leading to a second episode of shock some hrs.later.

PUNCTURE OF LIVER AND SPLEEN

When a high insertion site is chosen.

It also occur in the presence of Hepatomegaly (or) splenomegaly.

The Aspiration test and the high insufflation pressure will make it obvious that the Needle is sited incorrectly, in which case it should be withdrawn on re – sited.

COMPLICATIONS FROM THE DISTENSION MEDIUM:

Co2 accepted as distension medium for all operative laparascopies. Gas embolism is possible but uncommon because the gas is highly soluble , which allows resorption so quickly that even if these has been a moderate embolus, the circulatory changes return to normal within a few minutes and the patient recovers.

Cardiac arrhythmias may be due to excessive absorption of Co2.

Post operative pain is common with Co2 insufflation due to peritoneal irritation which is a result of production of carbonic acid. This chest pain may be confused with coronary heart disease and be treated inappropriately with anti –coagulants.

Theoretical chance of combustion when the usage of N_20 as a distension medium is unwise with high frequently bipolar electric current.

The only place for N_2O is where laparoscopy is being performed under local anaesthsia and the pain factor become important. This is really only applicable to tubal sterilization with clips on rings and not to more advanced laparoscopic techniques.

INSESRTION OF TROCARS AND CANNULAE([9,12,20,21,34])

It produce some of most serious injuries.

More common with sharp tipped trocars than blunt tipped trocars..

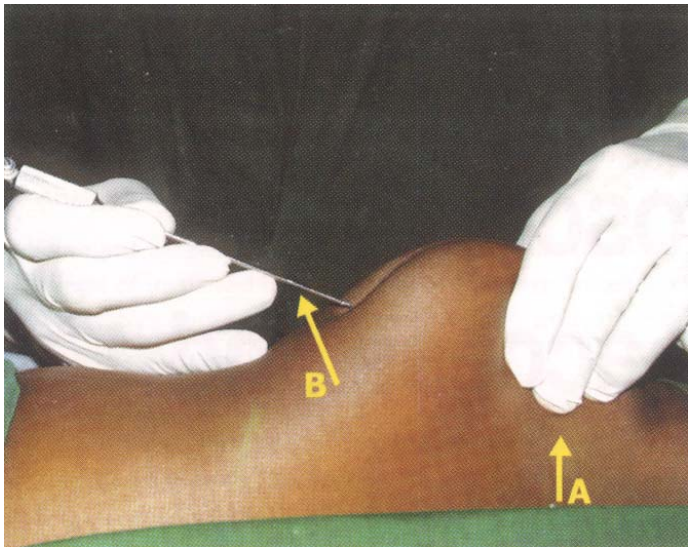
Insertion of the primary trocar and cannula is of necessity blind. The site of the secondary ports of entry must be selected carefully and the insertion must always be made under visual control. It is possible to produce complication during insertion even when the standard protocols have been meticulously observed.

INJURY TO VESSEL IN THE ABDOMINAL WALL

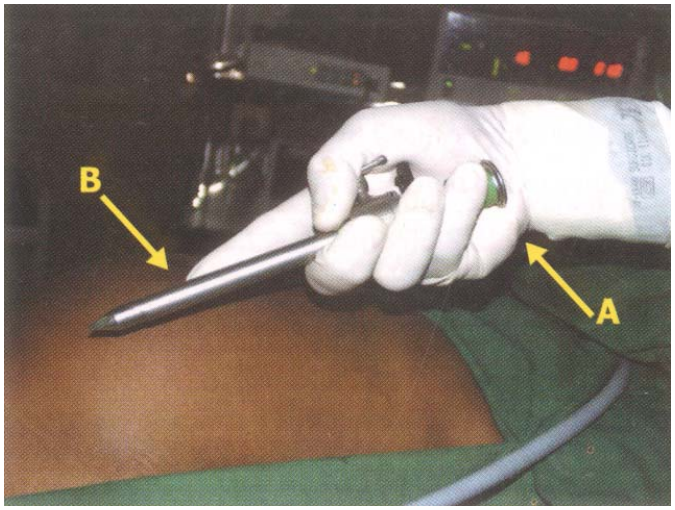
Superficial bleeding from the incision rarely give to concern and always stops with application of pressure.

Bleeding from puncture of the deep inferior epigastria artery is more serious.

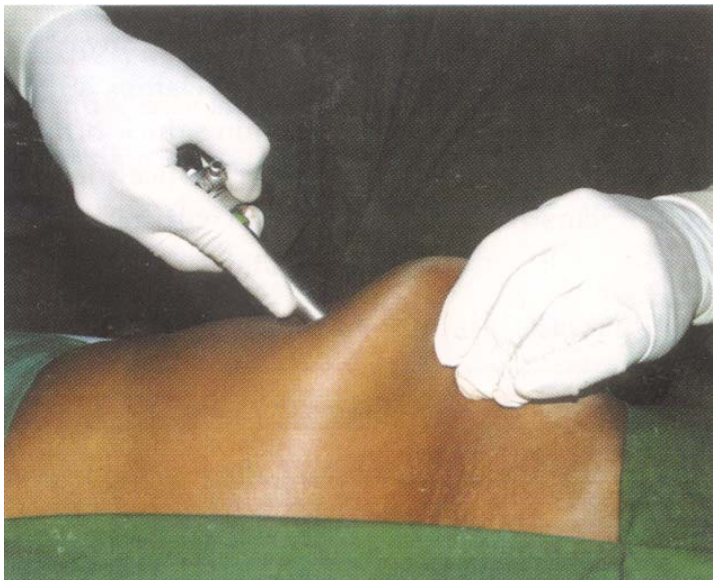
The artery is at risk during the insertion of secondary trocars and cannulae. This may be prevented by inserting them through the safety triangle, transilluminating the abdominal wall before insertion (or) by visualizing the artery as it runs lateral to the obliterated umbilical artery.



Veress needle insertion



Method of holding trocar



Insertion of the trocar

The Diagnosis by

1. The blood dripping into the pelvis from the trocar wound.
2. Spurting across the abdominal cavity.
3. Immediate (or) delayed appearance of large abdominal wall haematoma indicates damage to the deep inferior epigastric artery

The treatment

1. Insert the foley's catheter and the bulb should be at the level of bleeding point. It is now inflated and which gives mechanical compression to the bleeding point. So the bleeding stops.

2. The incision should be enlarged to about 2 cm in length to expos the anterior rectus sheath. A round bodied needle should be inserted through the full thickness of the abdominal wall from the sheath to the peritoneum under laparoscopic control. The needle point should be brought out again to the surface of the rectus sheath and knot tied firmly on the sheaths.

Occasionally, it may be necessary to open the wound wider to locate the bleeding artery.

INJURY TO AN INTRA ABDOMINAL VESSEL

Injury to minor blood vessels is usually self limiting (or) can be controlled by bipolar electro coagulation.

Damage to major vessels is more serious than with a veress needle because of the size of the trocar tip may result in profuse bleeding.

Injury to omental vessels may compromise the vitality of a segment of bowel.[15]

TREATMENT

Resuscitation

Laparotomy

Vascular repair (or ligation where necessary bowel resection and anastomosis.

A small leak from the inferior vena cava may not be immediately apparent. The intra abdominal pressures of the pneumoperitoneum and the decreased venous pressure induced by the trendelenburg position may temporarily control it. However as soon as the intra abdominal and venous pressures return to normal, the bleeding may recommence and produce a retroperitoneal haematoma and shock.

INJURY TO HALLOW VISCUS

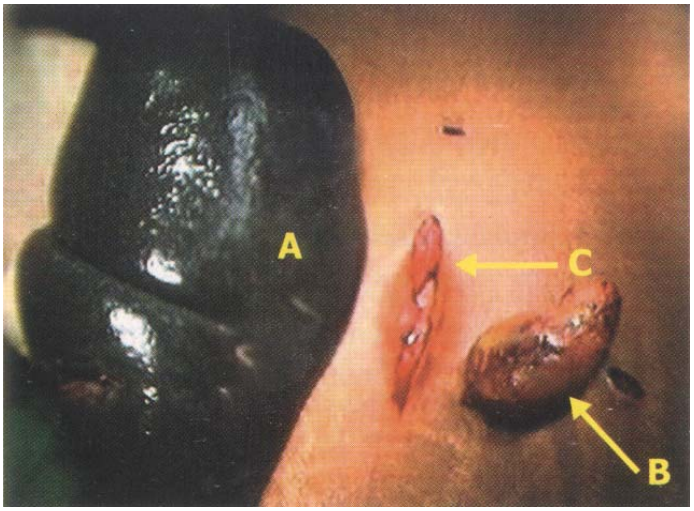
May vary from superficial damage to the serosa to complete penetration into the lumen. If penetration has occurred, the viscus may slip off the trocar, the trocar may remain within the lumen (or) rarely the trocar may pass right through a loop of bowel which becomes impaled upon it.

It is always important to inspect the bowel at the axis of insertion of the primary trocar and cannula to ensure that it has not been damaged. If the cannula remains within the bowel, the injury will be obvious by the recognition of mucosal folds. A through and through injury may be missed and become apparent by the sight of faecal soiling, a faecal smell when the pneumoperitoneum is released (or) the subsequent development of peritonitis.

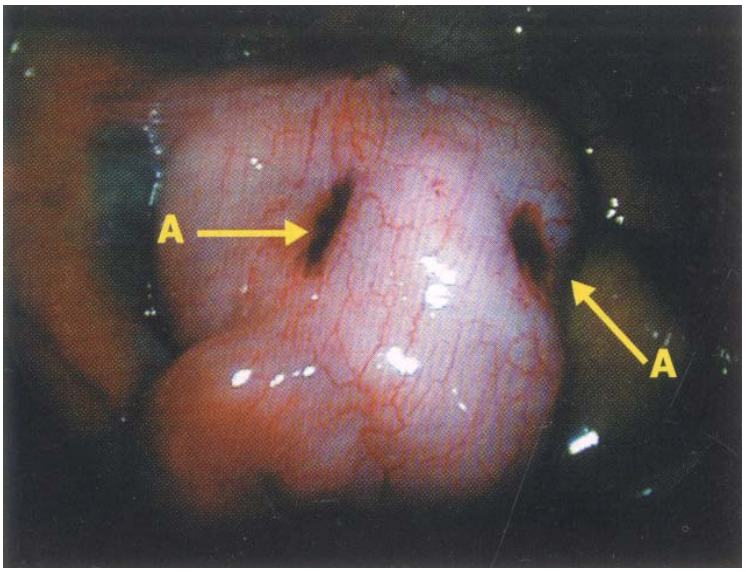
MANAGEMENT

Minor injuries are self limiting.

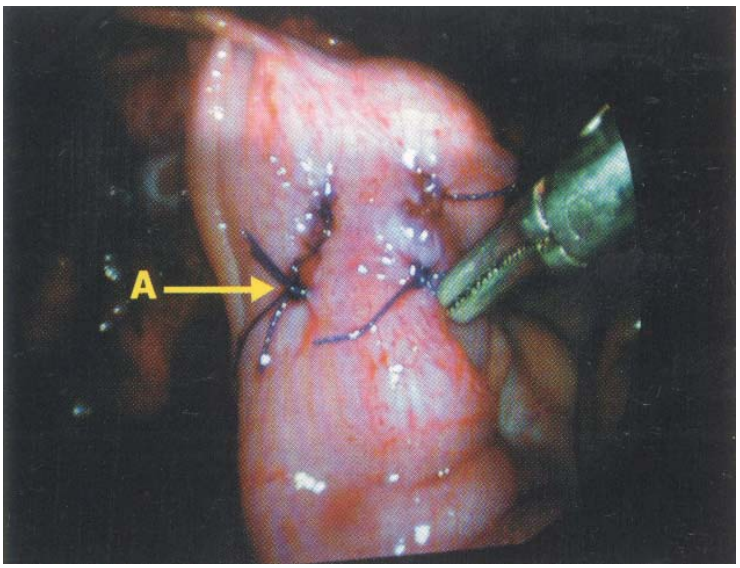
They should be inspected at the completion of the procedure. Peritoneal wash. to be given.



Excised spleen and gall bladder removed through mini laparotomy



Trocar injury – small bowel



Sutured with interrupted vicryl stitches

Injury To The Stomach and Bowel Managed By

1. Classical laparotomy – Perforation closure
2. Laparoscopic repair of the perforation.

Uterus – Small laceration may be treated with bipolar electrocoagulation if bleeding does not stop spontaneously.

Bladder laceration may be sutured in two layers using a laparoscopic intra corporeal suturing technique and a foley catheter should be inserted into the bladder.

THERMAL INJURIES

Burns from electric current were one of the major causes of complications.

The incidence of burns was dramatically reduced by the introduction of bipolar and thermal coagulation and mechanical devices to occlude the tuber. However the upsurge of operative laparoscopy by a generation of surgeons who have not been exposed to these complications before, has led to an increase in the incidence of electrical burns.

Monopolar electric current passes into the patient's body from the electrode, which may be forceps (or) a needle, the current passes into the patient tissues at the point of contact and then must return to the generator through the return plate. This is usually placed on the patient's leg. The effect of the electric current will depend on its power and power density, which on the area of application, duration of application. To obtain maximum tissue effect the area of application at the target organ is small.

The current passes from that small area along the path of least resistance towards the return plate. The area of return plate is large. So the power density at It's site of application to the skin is low.

Occasionally the monitoring system may not be properly earthed. If the current passes through an ECG electrode instead of the return plate, the Pt may suffer a skin burn because the ECG electrode is small and so the power density is high at this site.

Bipolar electro coagulation removes most of the dangers of distant electric burns.

The bowel is the most commonly injured organ the injury may range from minor blanching of the serosa to frank perforation requires laparotomy excision of the surrounding devitalized bowel and repair of defect. If the bleaching is significant laparotomy and over sewing of the area must be performed immediately.

Failure to do so may result in delayed ischaemic necrosis at the site of the burn.

Nothing may happen for upto 48 hrs.by which time the patient has gone home. The insidious development of vague abdominal symptoms, discomfort, anorexia and possibly Pyrexia occur. Fecal fistula and fecal. Peritonitis occur slowly. So the Pt become seriously ill over a period of days before readmission is requested. Laparotomy is followed by repair of the bowel (or) more often colostomy and drainage of the peritoneum is required.

Mechanical Instruments:

The main injuries caused by scissors (or) forceps are to blood vessels.

Other complication associated with Laparoscopy

I. Shoulder Pain:

The C02 is converted to carbonic acid when it is in solution with body fluids. This is irritant to the peritoneum. Diaphragmatic peritoneal irritation produce pain which is referred to the shoulder by the phrenic nerve. This pain may be confused with cardiac pain by the unwary physician and treated in appropriately.

II. Omental hermiation:

If the primary cannula is withdrawn with it valve closed, it is possible to draw a piece of omentum into the umbicical wound by the Negative pressure so produced. This is usually recognized immediately and the omentum is easily replaced. Hermiation may occur some hours after operation. It is usually easy to replace it under local anaesthesia and resuture the wound.

III. Explosion

Intra peritoneal explosion is a very rare but dramatic complication, if bowel is inadvertently punctured, methane gas is released . If Nitrous oxide has been used to create pneumoperitoneum, than, methane and nitrous oxide mixture formed is potentially explosive high frequency electric current may ignite the gas and cause an intra peritoneal explosion.

General complication of Lasparoscopy

Injury to adjacent organs:

Bleeding from solid organs (Liver and spleen) vascular injuries.

Puncture/perforation/cauterization of the bowel.

Transection / Performation bile ducts

Perforation of the bladder.

Puncture / Perforation of the uterus.

Complications of abdominal access

Port site Hernia

Wound Infection

Complication of specimen removal.

Port site recurrence of cancer

Splenosis

Endometriosis

Complication of the Pneumoperitoneum

Pnemothorax

Pneumomediastinum

Gas Embolus

Subcutaneous emphysema

GUIDELINES FOR PREVENTION BILE DUCT INJURIES DURING LAPAROSCOPIC CHOLECYSTECTOMY

Recognize "at-risk" situations

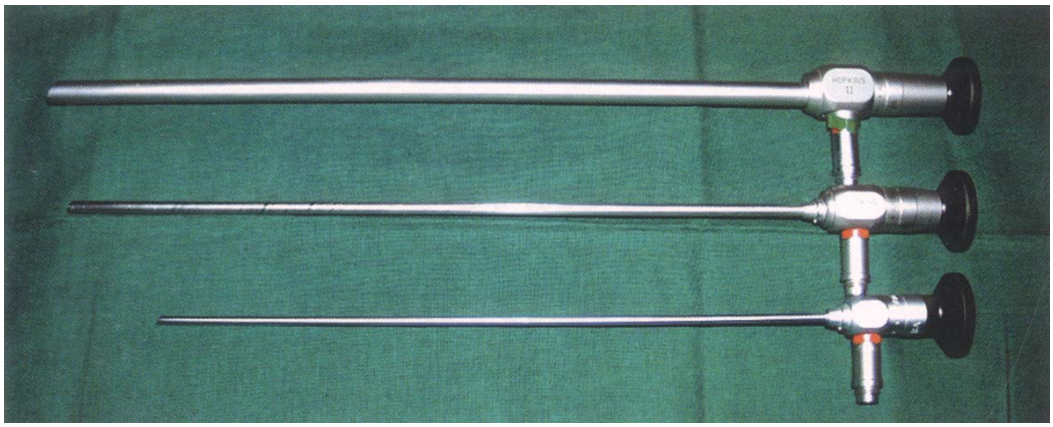
- Severe cholecystitis
- Fibrotic, shrunken gallbladder
- Aberrant anatomy
  - Absent or short cystic duct
  - Cystic duct arising from the right hepatic duct
  - Aberrant or accessory right hepatic duct
  - Aberrant right hepatic artery
- Retract gallbladder fundus superiorly and infundibulum to The right and inferior to open trangle of Calot
- Dissect lateral to medial
- Meticulously dissect the cystic duct and artery close to The gallbladder
- Make indicious use of cautery
- Do not clip, divide, or cauterize structures unless clearly Identified
- Perform intraoperative cholangiography if anatomy in doubt
- Covert to open if
- Operation is not progressing
- Anatomy in doubt
- Cholangiogram does not clearly define anatomy.

INSTRUMENT

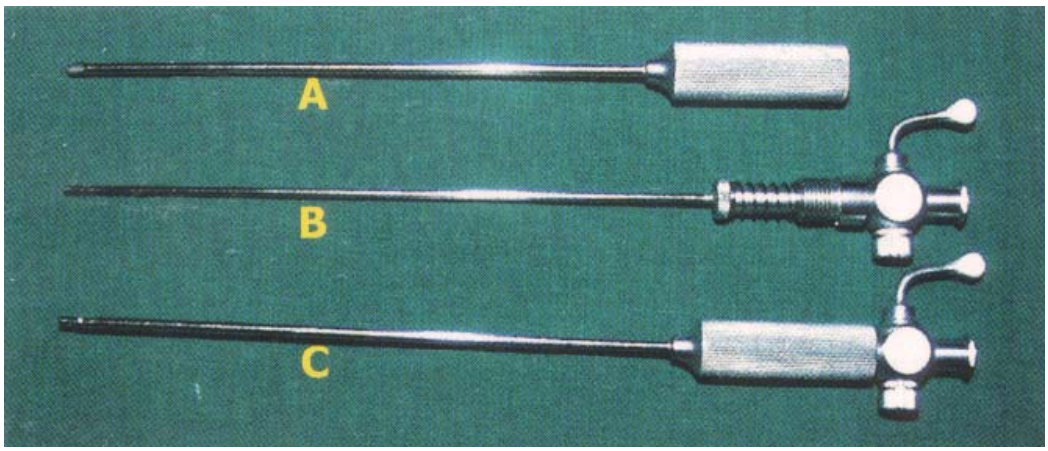
1. Distension Media
2. Pneumoinflator
3. Insufflating needle-Veress Needle
4. Primary trocar and cannula
5. Laparoscopes
6. Light sources and cables
7. Video systems

ANCILLARY INSTRUMENTS

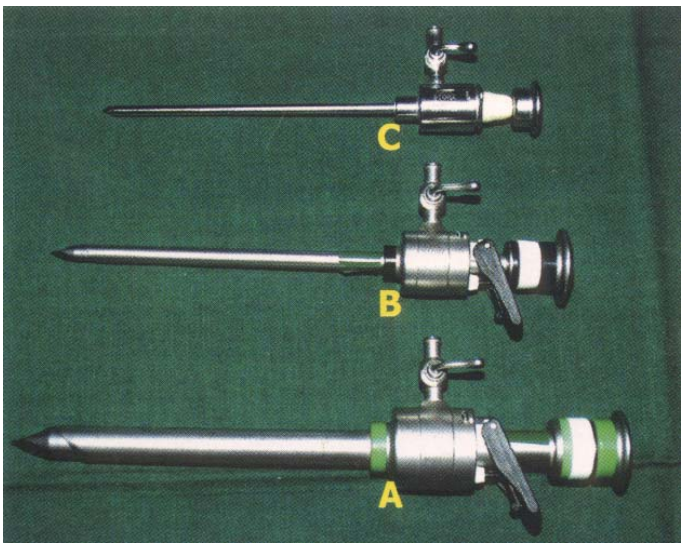
1. Forceps
2. Scissors
3. Electro surgical instruments
4. Laser
5. Sutures and ligatures
6. Clips and stapes
7. Flushing and suction instruments
8. Needles.



10mm, 5mm, 3mm, 30 degree scopes



Veress Needle



10mm, 5mm, 3mm, trocars

MATERIALS AND METHODS

Centre	:	Coimbatore Medical College, III Surgical Unit
Period of Study	:	24 Months
From	:	01.03.2004
To	:	31.3.2004
Total No.of Laparoscopic Surgery	:	84
Total No.of Laparoscopic		
Appendiocectomy	:	56
Cholecystectomy	:	23
Hernioplasty	:	2
Diagnostic laparoscopy	:	3
Age group of the patient	:	13 to 72
Male : Female	:	41 : 43
OBSERVATION AND RESULTS	:	
No.of coversion from		
laparoscopy to laparotomy	:	2
No.of patients associated with Comorbid condition	:	4
No.of patient land up in complication	:	
Intra-operative	:	3
Immediate Post operative	:	6
No.of patient cured from the illness		
Without complications	:	75

SPECIFIC PROCEDURES

In our unit we are routinely doing the following laparoscopic procedures.

1. Diagnostic Laparoscopy
2. Laparoscopic Appendicectomy
3. Laparoscopic Cholecystectomy
4. Laparoscopic Hernia repair

DIAGNOSTIC LAPAROSCOPY

Despite sophisticated methodology to image abdominal contents, establishment of a Diagnosis prior to surgery remains difficult for several conditions.

Unnecessary laparotomy is painful, increase hospital stay, increases cost relatively increased morbidity.

Diagnostic laparoscopy effectively establishes a diagnosis can be therapeutic, causes less morbidity than laparotomy.

Diagnostic laparoscopy is 81 to 96% accurately pin point patient problem.

More useful in gynecological problems, intra abdominal pathology and increasingly in abdominal trauma patients[35]

In our study we did 5 cases of Diagnstic laparoscopy –

1. A case of post operative adhesion release – A case of subacute intestinal obstruction initially treated conservatively later elective diagnostic lap planned, shows adhesive band extending from the old operative scar to the small intestional loop. Adhesive lysis done. Patient cured from the illness. (Patient known case of ruptured ectopic pregnancy 5 years before and operated for that previously).
2. A case of subacute intestional obstruction due to vitelo intestional band extending from the 2 x 1 cm size meckel's diverticulum to the umbilicus. Band excision done after diagnostic laparoscopy without intervening the meckel's diverticulum because of it's broad base and small size.
3. A case of Non specific pain abdomen Diagnostic lap shows multiple tubercles all over the peritoneum and omentum – Biopsy taken confirmed as tuberculous pathology and patient treated with ATT.
4. A case of fibroid uterus operated came with RIF mass – Diagnostic lap shows matted bowel loops with thick strands – adhesions, very difficult to proceed with. So laparatomy planned and resection anastomosis of ileum following adhesion release.
5. Young lady with multiple mesenteric and para aortic lymphadenopathy, Diagnostic lap performed for examination and node biopsy taken which later came as tuberculosis pathology.

LAPAROSCOPIC APPENDICECTOMY

Anaesthesia	:	GA
Patient position	:	Supine
Surgeon position	:	Pt's left
Table position	:	Moderate trendelenburg left tilt
Port position	:	10 mm – subumbilical
		Camera / Telescopic Port
		5 mm – Rt lumbar
		10mm- Lt iliac

Pneumoperitoneum with Veress Needle & CO2.

Insufflator	-	Flow rate	: 6 L / mint
Intra abdominal pressure	-	12 mm Hg.	
Diathermy	-	Biopolar	

Procedure:

Pneumoperitoneum created with Veress Needle

Sharp tipped trochar and cannula used to create camera port.

Other working ports (5 mm) created

Detailed examination and confirmation of the Diagnosis.

Identification of appendix

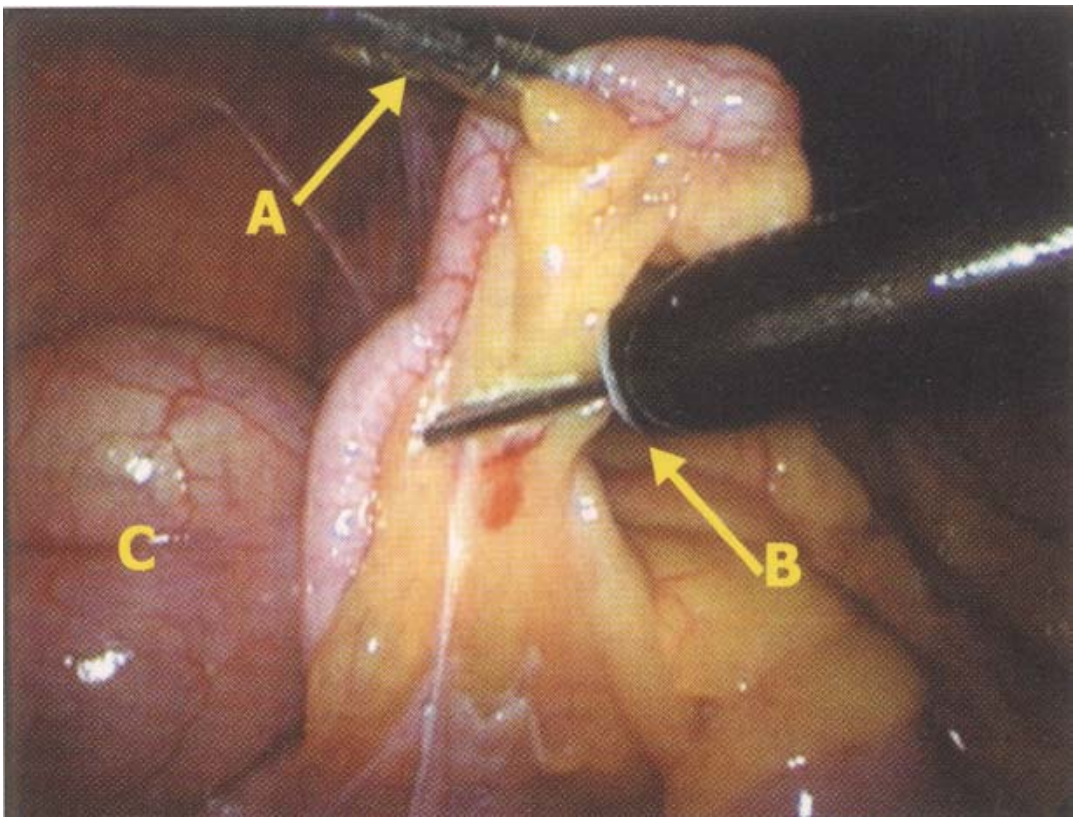
Display the mesoappendix

Coagulation (or) clipping the vessels.

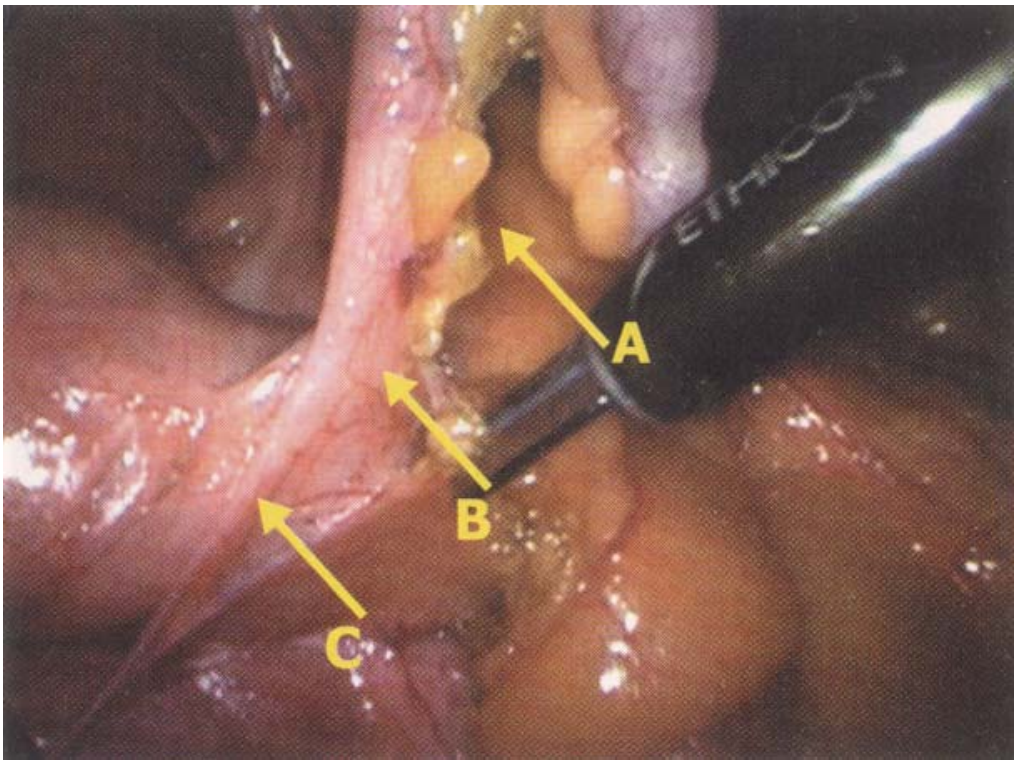
Skeletinizing the appendix

Appendicectomy after ligating Appendicular base.

Linea alba closed with single absorbable suture.



Holding of the appendix



Meso-appendix completely separated

LAPAROSCOPIC CHOLECYSTECTOMY

Anaesthesia	:	GA
Patient position	:	Supine
Surgeon position	:	Pt's left
Table position	:	Reverse trendelenburg position
Port position	:	10 mm – subumbilical Camera / Telescopic Port 5 mm – Mid epigastric 10mm – Subcostal Rt anterior axillary line 5 mm – Mid clavicular line

Pneumoperitoneum with Veress Needle & CO2.

Insufflator	-	Flow rate	: 6 L / mint
Intra abdominal pressure	-	12 mm Hg.	
Diathermy	-	Biopolar	

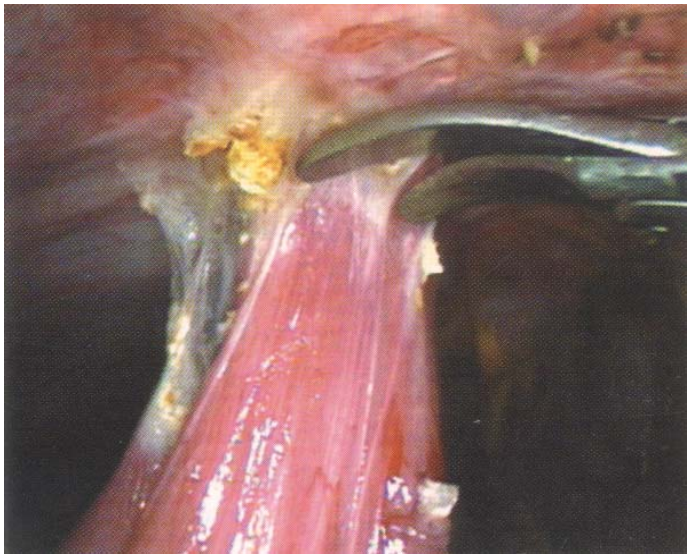
Procedure:

1. Ensure maximum cephalic traction.
2. Maintain lateral and Inferior traction on Hartmann's pouch. This menoeuvre avoids alignment of the cystic and common bile duct, allowing more precise identification of both structures.
3. Dissection should begin high in the neck of the gall bladder and proceed in a lateral to medical direction.

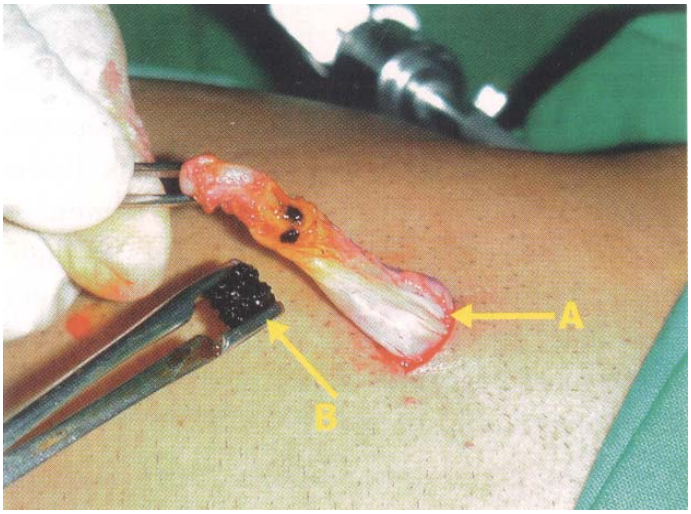
4. Hartmann's pouch should be turned medially for posterolateral dissection of GB serosa.
5. Dissect the neck of the gall bladder from it's hepatic bed.
6. Clear view of cystic duct should be obtained before the application of clips.
7. Intraopeative cholangiography (Not routinely used in our unit)
8. Division of cystic artery and cystic duct.
9. Dissection should continue close to GB wall and away from the liver hilum.
10. Removal of dissected gall bladder.
11. Wash and Haemostasis.
12. Closure after letting out pneumperitoneum .

Common complications come across

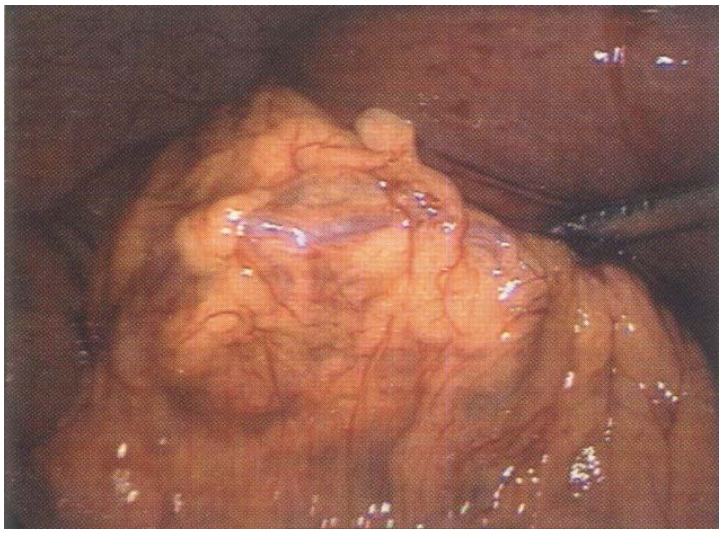
1. Due to extensive adhesions the procedure converted into open cholecystectomy
2. Bleeding from the liver – GB Bed/fossa
3. Injury to CBD
    a. Diathermy injury
    b. Clipping of CBD
4. Difficulty in delivering the specimen



Adhesiolysis



Gall bladder brought out partially through epigastric port



Omental covering of gall bladder

LAPAROSCOPIC HERNIA REPAIR

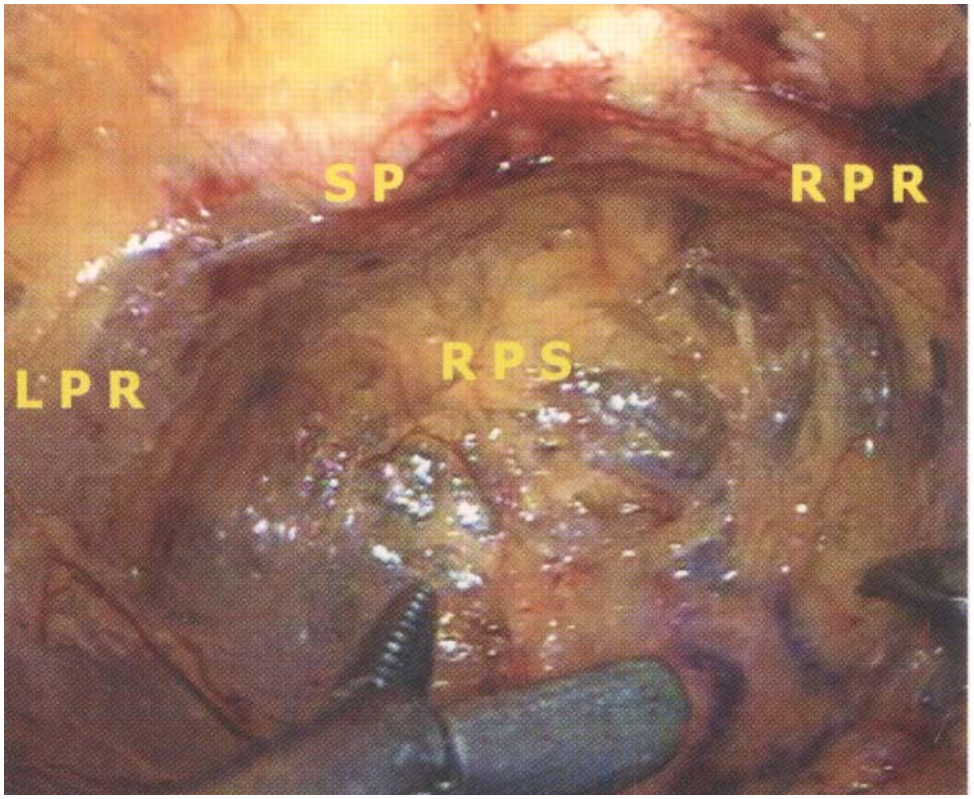
Types of laparoscopic hernia repair

1. Transabdominal preperitoneal repair
2. Extra peritoneal repair

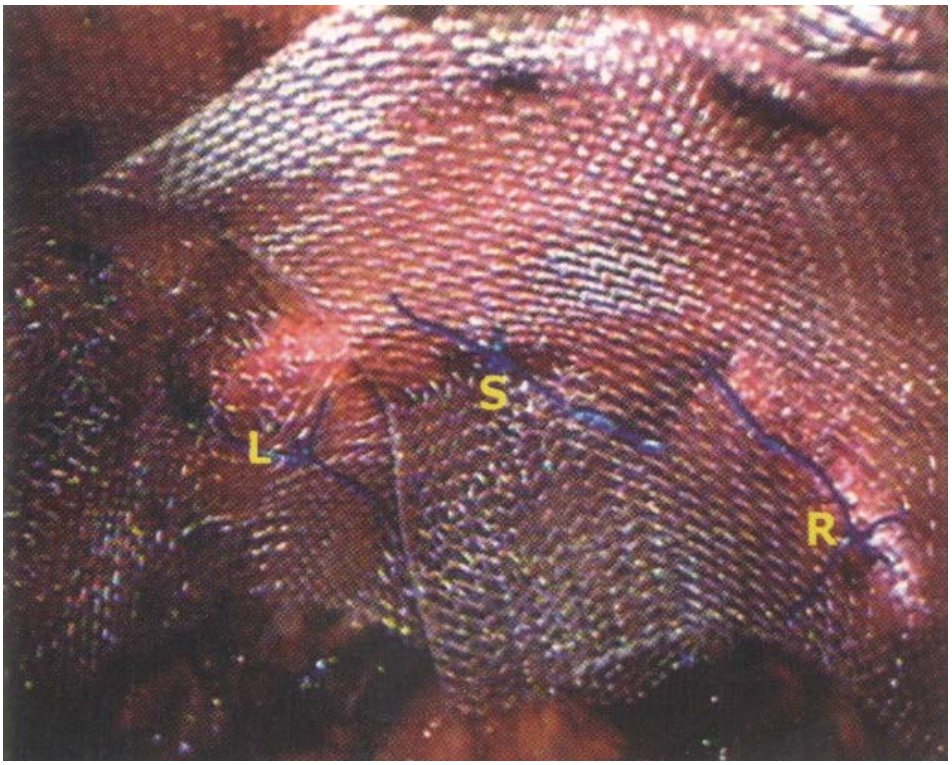
In our study we did only two cases of Laparoscopic hernia repair. Both are extraperitoneal repair.

Procedure:

1. Abdominal cavity not entered
2. Telescopic extraperitoneal dissection to create working space.
3. Anatomical structures identified
4. Dissection at cord and sac level.
5. Mesh placement
6. Anchoring of the mesh.
7. After haemostasis closure of the wound.



Total extraperitoneal laparoscopic hernia repair



Mesh was fixed

COMPLICATION CASES

1.	Name	:	Mary
	Age	:	53
	Sex	:	Female
	IPNO.	:	12175
	Diagnosis	:	Subacute Appendicitis

Failure due to faulty technique and poor skill

This is the first laparoscopic surgery of our unit. The port made after creating pnemoperitoneum, skeletinization of the appendix was started after detailed laparoscopic examination of abdomen and pelvis. While skeletinizing the Appendix bleeding from the near by appendicular vessel noticed, using Bipolar diathermy, the bleeding tried to control, but it is not possible, so the procedure immediately terminated and converted into open Appendicetomy. Since it is the first case it took nearly two hrs. for the Procedure.

2.	Name	:	Mani
	Age	:	58
	Sex	:	Female
	IPNO.	:	21617
Diagnosis	:	Calculus Cholecystitis.	
Procedure	:	Lap cholecystectomy	
Complications	:	Conversion	
Indications	:	Intra hepatic gall bladder/chronic contracted GB.	

Failure due to disease process perse.

This patient was obese lady, a case chronic cholecystitis with normal CBD size planned for laparoscopic cholecyetectomy. Pneumoperitoneum created and ports made, detailed intra peritoneal and pelvic examination done.

The gall bladder appears deformed, thickend and irregular, intra Hepatic in location may be due to congenital deformity (or) fibrosis and contraction because of chronic inflammatory process. The dissection tried with much difficulty but dissection not possible, so open cholecystectomy planned and progressed. The gall bladder surrounding show adhesion and cystic duct, neck of the GB could not be identified properly even with open method. The gall bladder measuring about 3.5 x 3 x 2 cm in size grossly

deformed with surrounding thick collection (This finding not correlated well with pre op radiological findings) Drain kept and after giving thorough wash and attaining proper haemostasis. Wound closed. Patient recovered well in the post op period.

3.	Name	:	Mylathal
	Age	:	45
	Sex	:	Female
	IPNO.	:	41276
Diagnosis		:	RIF Mass
Procedure		:	Diagnostic lap.
Complications		:	Conversion
Indications		:	Post operative extensive adhesions Involving ileum. Ileal resection and end to end Anastamosis with caecostomy.

Failure due to disease process perse.

Patient 45 years old lady admitted
c/o swelling in the right lower abdomen – 6 months duration,
H/0 loss of appetite present
No H/0 alteration of bowel habits, micturation
H/o loss of weight present
Past History : Patient underwent surgery for myoma uterus (abdominal hystectomy) 6 month before at our Hospital

On examination

8 x 6 cm size freely mobile mass in the RIF

Rright paramedian lower abdominal healthy scar present.

USG - RIF mass thicked ileal loops - ? TB abdomen.

CT - Thickened bowel loops in the RIF – To rule out – TB abdomen.

Chest physician opinion - ? TB abdomen

GE opinion - ? Cecal / ileocecal growth

Patient persistently c/o pain and all the other investigation not contributing to the diagnosis properly so the diagnostic laparscopy planned. Pneumo-peritoneum created, ports made, thorough laparoscopic examination made.

Extensive adhesion involving the terminal ileum and parietal wall with thick fibrotic strands matted bowel loops noticed at the RIF. Angulation of bowel loops noticed at the RIF.

Procedure:

Stands released with diathermy with lot of difficulty, because the stands all thick and short, while releasing injury to the near by bowel loop noticed, so the resection anastamosis planned with open method.

The procedure completed with open method.

4.	Name	:	Jaya
	Age	:	38
	Sex	:	Female
	IPNO.	:	46478
Diagnosis		:	Calculus Cholecystitis.
Procedure		:	Lap cholecystectomy
Complications		:	Biloma formation
Indications		:	? Due to accessory bileduct.

This patient is blind since birth had chronic abdominal pain 2 years duration. General and systemic examination normal. USG abdomen shows distended gall bladder with multiple gall stones. CBD normal, so Laparoscopic cholecystetomy planned. Pneumoperitoneum created , ports made and peritoneal examination done. Cystic duct, and cystic artery isolated and clipped, now dissection continued in the undersurface of liver. Dissection is difficult due to chronic inflammation. Procedure completed.

In the 2nd post op period patient dull look and c/o pain in the RHC. mild diffuse swelling and tenderness noticed in subsequent days. Patient also had mild fever on the 5th POD. USG was done and shows about 600 ml collection in the GB fossa, CBD, IHBR normal. USG guided Aspiration done.

Patient improved well but after 1 week repeat USG shows again 600 ml of collection Rpt Aspiration done, serial USG showed no more increase in collection and organization of the existing collection.

THE COMPLICATIONS WE COME ACROSS COMMONLY IN OUR STUDY.

1. Conversion of the Lap Surgery in to Open Surgery … 2
2. Intra operative Bleeding … 1
3. Difficulty in delivering the specimen … 1
4. Nausea and vomiting … 2
5. Biloma formation … 1
6. Subcutaneous Surgical emphysema … 1
7. Shoulder pain … 1

Sl.No.	Complication	No.of Patient	Management
1.	Coversion	2	Laparotomy
2.	Intra operative Bleeding	1	Laparotomy
3.	Difficulty in delivering the specimen -GB	1	Incision at the port site extended and the specimen delivered.
4.	Nausea and vomiting	2	Conservative – Nil per month
5.	Biloma	1	USG Guided Aspiration
6.	Subcutaneous	1	Conservative
7.	Shoulder pain	1	Conservative – Back rest Head end elevation.

CONCLUSION

The potential complications of laparoscopic procedure include those related to laparoscopy and those related to the specific procedure. The majority of these complications occur during the early learning phase for laparoscopy. They also may occur, however during procedures performed by surgeon who have considerable laparoscopic experience due to the disease process perse. As new application for laparoscopy continue to emerge, it is important for the surgeon to be familiar with the possible complications associated with the various laparoscopic procedure. Very good infrastructure, adequate and proper training and skill are mandatory to minimize the complication and good surgical out come. Only through an appreciation of the potential complications of a procedure can their overall incidence be reduced to a minimum,.

PROFOMA

NAME :

AGE / SEX :

IPNO. :

WARD :

DATE OF ADMISSION :

DATE OF DISCHARGE :

DATE OF SURGERY :

MAIN COMPLIANTS :

COMORBID CONDITIONS :

CLINCIAL EXAMINATION :

USG / BIOCHEMICAL :

DIAGNOSIS :

PROCEDURE :

FINDINGS :

OUT COME :

COMPLICATIONS :

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To incidence and outcome of common bile duct
Injuries during laparoscopic laparoscopic cholecystectomy
Surg endose 16 : 1098 – 1104, 2002.

MASTER CHART

S. No	Name	Age/Sex	IP.No	Ward	DOA	DOS	DOD	Co-morbid condition	Diagnosis	Procedure	Complication	Out come
1.	Poomani	16/F	3413	FS-III	29.08.04	30.08.04	01.09.04	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Intra op bleed	Excellent
2.	Chandra	32/F	48862	FS-III	06.09.04	07.09.04	08.09.04	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
3.	Boopathy	28/M	43411	MS-IV	20.09.04	21.09.04	22.09.04	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
4.	Ruby	30/F	50718	FS-III	05.10.04	06.10.04	07.10.04	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
5.	Bavithra	16/F	51442	FS-III	12.10.04	13.10.04	14.10.04	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
6.	Velusamy	48/M	53300	Special	26.10.04	27.10.04	28.10.04	Nil	Calculus Cholecystitis	Lap Cholecystectomy	Nil	Excellent
7.	Banu	32/F	54549	FS-III	28.10.04	29.10.04	30.10.04	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
8.	Sameer	14/M	54548	FS-III	02.11.04	03.11.04	04.11.04	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
9.	Maragatham	35/F	63063	FS-III	05.12.04	06.12.04	07.12.04	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
10.	Nagaveni	14/F	1084	FS-III	06.01.05	07.01.05	07.01.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
11.	Saravanan	26/M	1004	MS-IV	10.01.05	11.01.05	11.01.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
12.	Kuvindhan	29/M	66622	MS-IV	10.01.05	11.01.05	11.01.05	Nil	Rec.Sub Acute Intestinal Obstruction	Diagnostic laparoscopy	Nil	Excellent
13.	Yasmin	13/F	2625	FS-III	21.01.05	22.01.05	22.01.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
14.	Balamurugan	26/M	3786	Special	30.01.05	31.01.05	01.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
15.	Kalpana	17/F	3799	FS-III	30.01.05	31.01.05	01.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy		Excellent

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16.	Vasugi	19/F	3712	FS-III	30.01.05	01.02.05	02.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
17.	Suresh Gandhi	14/M	4503	MS-IV	04.02.05	05.02.05	06.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
18.	Srinivasan	50/M	3121	MS-IV	07.02.05	08.02.05	09.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
19.	Siva	32/M	5873	MS-IV	10.02.05	12.02.05	13.02.05	Nil	Chr. Cholecystitis	Lap Cholecystectomy	Shoulder Pain	Good
20.	Gowri	27/F	7197	FS-III	14.02.05	15.02.05	17.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
21.	Angammal	30/F	8468	FS-III	21.02.05	22.02.05	23.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
22.	Muniappan	30/M	9564	MS-IV	25.02.05	26.02.05	27.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nausea	Excellent
23.	Umamaheswari	19/F	9536	FS-III	25.02.05	26.02.05	28.02.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
24.	Murugesan	21/M	8444	MS-IV	28.02.05	01.03.05	03.03.05	Nil	Acute Cholecystitis	Lap Cholecystectomy	Nil	Excellent
25.	Jeyaprakesh	13/M	10794	MS-IV	04.03.05	05.03.05	06.03.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
26.	Rajagopal	24/M	10922	MS-IV	04.03.05	05.03.05	07.03.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
27.	Setha	28/M	13891	MS-IV	25.03.05	26.03.05	28.03.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
28.	Murugesh	35/M	12246	MS-IV	14.03.05	15.03.05	16.03.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
29.	Chinnasamy	42/M	13815	MS-IV	21.03.05	22.03.05	25.03.05	DM	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
30.	Ramathal	30/F	15176	FS-III	01.04.05	02.04.05	03.04.05	Nil	Chr. Abdominal pain	Diagnostic Lap	Nil	Excellent

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31	Kesavan	20/M	17520	MS-IV	08.04.05	09.04.05	11.04.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nausea	Excellent
32	Aseena	16/F	17794	FS-III	11.04.05	12.04.05	14.04.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
33	Vijaya	30/F	18766	FS-III	15.04.05	16.04.05	17.04.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
34	Krishnaveni	24/F	20329	FS-III	22.04.05	23.04.05	25.04.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
35	Mani	58/F	21617	FS-III	01.05.05	07.05.05	10.05.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Good
36	Thulasimani	41/F	23138	FS-III	09.05.05	10.05.05	12.05.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
37	Kalpana	20/F	24487	FS-III	13.05.05	14.05.05	16.05.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nausea	Excellent
38	Periyasamy	26/M	24565	MS-IV	16.05.05	17.05.05	18.05.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
39	Mahalingam	53/M	25938	MS-IV	20.05.05	24.05.05	26.05.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Difficulty in Delivering specimen	Excellent
40	Jeeva	30/F	27236	FS-III	30.05.05	31.05.05	02.06.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
41	Hussain	32/M	27347	MS-IV	30.05.05	31.05.05	02.06.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
42	Nandhiji	13/F	29904	FS-III	13.06.05	15.06.05	16.06.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
43	Pandian	32/M	29910	MS-IV	17.06.05	18.06.05	17.06.05	Nil	Cholilithiasis	Lap Cholecystectomy	Nil	Excellent
44	Jayaram	42/M	31817	MS-IV	27.06.05	28.06.05	30.06.05	Nil	Cholilithiasis	Lap Cholecystectomy	Nil	Excellent
45	Selvam	30/M	32419	MS-IV	01.07.05	02.07.05	03.07.05	Nil	Cholilithiasis	Lap Cholecystectomy	Nil	Excellent

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46	Ranjith Kumar	20/M	31988	MS-IV	04.07.05	05.07.05	07.07.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
47	Gopal	48/M	40224	MS-IV	01.08.05	02.08.05	04.08.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
48	Revathy	17/F	41301	FS-III	08.08.05	09.08.05	10.08.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
49	Mohammed	20/M	41341	MS-IV	08.08.05	09.08.05	11.08.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
50	Shofia	23/F	42543	FS-III	12.08.05	13.08.05	14.08.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Good
51	Somasundari	47/F	44621	FS-III	22.08.05	23.08.05	25.08.05	DM	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
52	Mylathal	45/F	41276	FS-III	29.08.05	30.08.05	02.09.05	Nil	RIF-Mass	Diagnostic Lap	Laparotomy	Good
53	Selvam	78/M	46724	MS-IV	02.09.05	03.09.05	05.09.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
54	Jaya	38/F	46478	FS-III	05.09.05	06.09.05	07.09.05	Blind	Cal. Cholecystitis	Lap Cholecystectomy	Biloma	Excellent
55	Mohan	35/M	47692	MS-IV	16.09.05	17.09.05	19.09.05	Nil	Left -Bubonocele	Lap Hernioplasty	Nil	Excellent
56	Neenumol	13/F	47730	FS-III	16.09.05	17.09.05	19.09.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
57	Vasantha	25/F	48994	FS-III	23.09.05	24.09.05	25.09.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
58	Thiyagu	38/M	50245	MS-IV	26.09.05	25.09.05	27.09.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
59	Kalishwari	15/F	51657	FS-III	03.10.05	04.10.05	05.10.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
60	Pachalingam	55/M	57564	MS-IV	14.10.05	15.10.05	16.10.05	HT	Cholilithiasis	Lap Cholecystectomy	Nil	Excellent

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61	Sundaraj	25/M	51942	MS-IV	14.10.05	15.10.05	17.10.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
62	Santhi	40/F	53984	FS-III	17.10.05	18.10.05	19.10.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
63	Sathyabama	45/F	53960	FS-III	17.10.05	18.10.05	19.10.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
64	Selvaraj	28/M	54101	MS-IV	17.10.05	18.10.05	19.10.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
65	Nagarajan	30/M	56577	MS-IV	28.10.05	29.10.05	30.10.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
66	Subhash	27/M	57676	MS-IV	04.11.05	05.11.05	07.11.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
67	Perumal	27/M	58099	MS-IV	07.11.05	08.11.05	10.11.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
68	Selvaraj	37/M	58095	MS-IV	11.11.05	12.11.05	14.11.05	Nil	A.Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
69	Sivakumar	27/M	59016	MS-IV	11.11.05	12.11.05	14.11.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
70	Kannammal	36/F	58866	FS-III	14.11.05	15.11.05	16.11.05	Nil	Cal. Cholecystitis	Lap Cholecystectoy	Nil	Excellent
71	Sunitha	28/F	61590	FS-III	24.11.05	25.11.05	26.11.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
72	Nareema	19/F	61544	FS-III	24.11.05	25.11.05	26.11.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
73	Loganathan	18/M	61517	MS-IV	28.11.05	29.11.05	30.11.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
74	Alliammal	60/F	61510	FS-III	11.12.05	12.12.05	14.12.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
75	Arumugam	71/M	63783	MS-IV	08.12.05	09.12.05	11.12.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent

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76.	Vijayarajan	29/M	63694	MS-IV	08.12.05	09.12.05	11.12.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
77.	Hamsa	45/F	42519	FS-III	15.12.05	16.12.05	18.12.05	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
78.	Lakhsmi Boy	60/F	63743	FS-III	10.12.05	19.12.05	23.12.05	Nil	Mucocele of Gall bladder	Lap Cholecystectomy	Nil	Excellent
79.	Nachimuthu	22/M	64996	MS-IV	18.12.05	19.12.05	20.12.05	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
80.	Radha	28/F	67523	FS-III	01.01.06	02.01.06	03.01.06	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
81.	Rathinam	48/F	63629	FS-III	08.01.06	09.01.06	10.01.06	Nil	Cal. Cholecystitis	Lap Cholecystectomy	Nil	Excellent
82.	Latha	35/F	2877	FS-III	19.01.06	20.01.06	22.01.06	Nil	Sub Acute Appendicitis	Lap Appendicectomy	Nil	Excellent
83.	Myilsamy	45/M	12064	MS-IV	09.03.06	10.03.06	11.03.06	Nil	Right Inguinal Hernia	Lap Hernioplasty	Mild Surgical Emphyema	Excellent
84.	Thangammal	72/F	12067	FS-III	09.03.06	10.03.06	12.03.06	Nil	Cholelithiasis	Lap Appendicectomy	Nil	Excellent